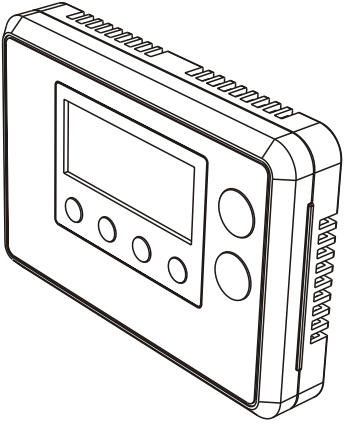
ZTS-100
Z-Thermostat

USER MANUAL



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ZTS-100 Z-Thermostat

Introduction

Welcome to the Z-Wave world of home automation, your ZTS-100 Z-Thermostat (Figure 1) is a comfort control master that allows to control your room temperature with programmable time schedule WAKE, AWAY, HOME and SLEEP event which can maximize energy conservation and comfort while minimizing the effort required to maintain the appropriate temperature in your home whether you are at home or away.

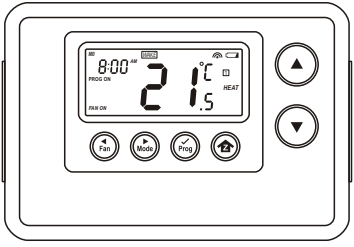
Also, it can be utilized to control / check your room temperature by the smart phone or PC while you are at office, home anywhere or around the world which can go through the Z-Wave gateway control.

ZTS-100 can be configured as either **"Frequently Listening Routing Slaves"** (FLiRS) or **"Always Listening"** node and it will distinguish the power source (batteries or 24Vac) automatically and switch to appropriate mode during inclusion stage.

FLiRS node type is targeted for battery operated applications and will enter sleep mode frequently in order to conserve battery consumption that can provide flexibility if there is out of 24Vac power line.

Always Listening node type is targeted for AC power operated applications and it can act as a repeater, which will re-transmit the RF signal to ensure that the signal is received by its intended destination by routing the signal around obstacle and radio dead spots.

Figure 1. ZTS-100



Features List

HVAC System Type Compatible:
- Standard (gas/electric) or Heat Pump

Multistage System Compatible:
- Standard HVAC Systems: 2 stage heating, 1 stage cooling
- Heat Pump Systems: 2 stage heating, 1 stage cooling

Heat Pump change over valve:
- Selectable change over with cool or with heat

Power:
- Powered by alkaline batteries AA x 4pcs or 24Vac

Program Style:
- 2 program modes for scheduling (Mo-Fr, Sa-Su)
- 4 Separate Time and Temperature Settings for each program
- Heat and Cool set-points for each program
- Temporary Program Override
- Permanent Program Override
- Built-in flash memory stores heat and cool program settings

Temperature Display and Control:
- Temperature display in °F or °C
- Temperature Measurable Range: 32-99°F / 0-40°C
- Temperature Setting Range: 41-99°F / 5-37°C
- Adjustable Temperature Control Swing/Differential
  a) Swing: 1°F, 2°F, 3°F or 4°F (0.5°C, 1.0°C, 1.5°C or 2°C)
  b) Differential: 1°F, 2°F, 3°F or 4°F (0.5°C, 1.0°C, 1.5°C or 2°C)
- Advanced Recovery Mode (ARM)
- Defrost Function
- Short cycle start up protection

Clock:
- Time display format: 12/24 hour clock selection with day displayed

Filter Counter:
- Filter change reminder displayed after 500 hours usage (500-4000hrs)

Others:
- Support Network Wide Inclusion (NWI) and Explore Frames
- Support "Frequently Listening Routing Slaves" (FLiRS) or "Always Listening"
- Support Simple mode
- Battery Low Indicator
- Built-in white LCD Backlight

Glossary

Device or Node	Devices and nodes are all terms to describe an individual Z-Wave device. These are all interchangeable when setting up your Z-Wave network.
Inclusion	Add a Z-Wave device to the network.
Exclusion	Delete a Z-Wave device from the network.
Remove	To take a device out of a group, scene or association group while that device still exists in the same Z-Wave network.
Network Wide Inclusion (NWI)	Network Wide Inclusion (NWI) enables both end-user friendly, Plug and Play like Z-Wave network installation as well as professional installation scenario where the inclusion process in terms of time will be reduced significantly. NWI is a feature supported by a new frame type named Explorer which enables the Z-Wave protocol to implement Adaptive Source Routing.
Z-Wave Network	A collection of Z-Wave devices is controlled by primary and secondary controllers operating on the same system. A Z-Wave network has its own unique ID code so that controllers not in the network cannot control the system.
Primary Controller	The first controller is used to set up your devices and network. Only the Primary Controller can be used to include or delete devices from a network. It is recommended that you mark the primary controller for each network for ease in modifying your network.
Secondary Controller	A controller containing network information about other devices within the network and is used for controlling devices. Secondary controller is created from the Primary Controller and cannot include or delete devices to the network.

Inclusion Controller	A controller containing network information about other devices within the network and is used for controlling devices. Inclusion controller is created from the Primary Controller in a SIS enabled Z-Wave network. Inclusion Controller has the ability to add and remove devices from the network.
Scene	A collection of Z-Wave devices configured to turn to a specific level, setting, mode, or perform an operation. Scenes are usually activated by a controller, timed event, or specific conditions.
Association	Association is used to organize nodes in different groups allowing the device to identify the nodes by a group identifier. The groups can also be copied to other devices.

Physical Installation and Wiring

ⓘ CAUTION

- Read the enclosed instructions carefully before installing your new Z-Thermostat. Pay close attention to all warnings and notes and carefully follow the installation steps in the order they are presented to save time and minimize the risk of damaging the thermostat or the system it controls.
- Turn off ZTS-100 and the electronic devices (e.g. heater, cooler) which will be connected and the electric source before installation and maintenance. It is highly recommended that the installation procedure is processed by trained personnel.

Battery safety!

- Use new batteries of the recommended type and size only.
- Never mix used and new batteries together.
- To avoid chemical leaks, remove batteries from the ZTS-100 if you do not intend to use the unit for an extended period of time.
- Dispose of used batteries properly; do not burn or bury them.

Installation Location:

The Thermostat is restricted to be used in indoor only. It should be mounted on an inner wall about 1.5m above the floor at a position where it is readily affected by changes of the general room temperature with freely circulating air. Avoid mounting above or near hot surfaces or equipment (e.g. TV, heater, refrigerator). Avoid mounting where it will be exposed to direct sunshine, drafts, or in a laundry room or other enclosed space. Do not expose this unit to dripping or splashing.

Wiring:

- Be sure the operation mode is OFF and Fan selection is Fan Auto
- Wire the proper cables at the terminal block according to the circuit diagram
- Afterward, push all cables back into the wall
- Do not use metal conduit or of cable provided with a metal sheath
- Recommends adding fuse or protective device in the line circuit

Terminals	Symbol
Cool changeover (heat pump)	O
Heat changeover (heat pump)	B
2nd Stage heater	W2
1st Stage heater	W1
Fan	G
Compressor	Y
24Vac Power for Cooling	RC
24Vac Power for Heating	RH
24Vac Common	C

Important!

The ZTS-100 can be powered by alkaline batteries AA x 4pcs or 24Vac.

Connect the "24Vac Common" (typically the black wire/terminal) and "24Vac Power" (typically the Red wire/terminal) from the HVAC system to the ZTS-100 HVAC System terminal block "C" and "RH" or "RC" terminals (the RH and RC terminals are default tied together).

Common or Split Transformer Systems:

Most HVAC systems have a common heating and cooling transformer. A wire is connected to tie the RH and RC inputs together for this configuration. If you have a system with separate heating and cooling transformers, you will need to disconnect the RH and RC wire.

When wiring split systems, wire the heating systems "24Vac Power" (red wire) to the ZTS-100 "RH" terminal, and wire the cooling systems "24Vac Power" to the ZTS-100 "RC" terminal. Also wire the cooling systems "24Vac Common" to the ZTS-100 "C" terminals.

Note: Do not split RC/RH for Heat Pump systems!

Figure 2.
Non-heat pump (Standard Gas or Electric) HVAC system wiring

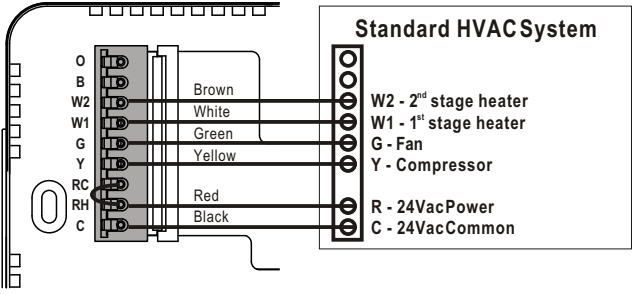
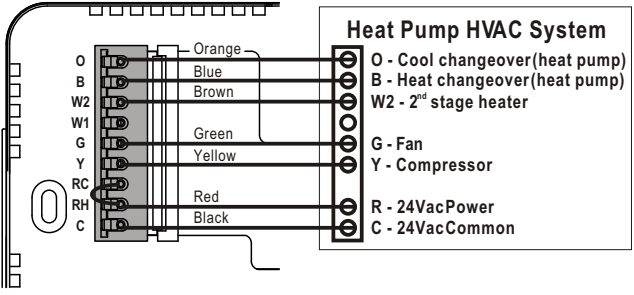


Figure 3.
Heat pump system wiring



Jumper Settings for ELECTH-HPUMP and HE-HG:

Jumper	Function Description
ELECTH HPUMP	Set to ELECTH for non heat pump system (**Default**)
ELECTH HPUMP	Set to HPUMP for heat pump system
HG HE	Set to HG for Gas heat-fan controlled unit (**Default**)
HG HE	Set to HE for Electrical heat-fan controlled unit

Mounting:

1. Open the ZTS-100 by pushing the hook (Figure 5)
2. Install AAx4pcs batteries if using battery power (Alkaline batteries are recommended)
3. Check the polarity of the batteries and the "+/-" marks inside the battery compartment
4. Connect 24Vac power if using 24Vac power source
5. Place the cables at the hole near the terminal block
6. Insert 2 pieces of wall anchors into the holes of the wall
7. Fasten the thermostat with 2 pieces of long screws through the 2 mounting holes (Figure 6)
8. Install the top housing by hooking the bottom (Figure 6)

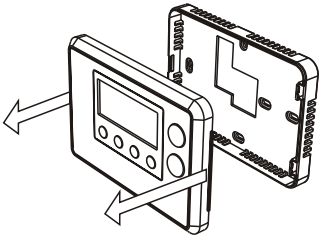


Figure 5. Open ZTS-100

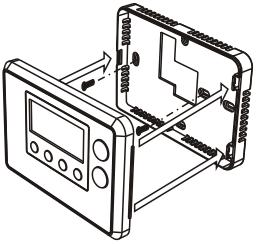


Figure 6. Install the top housing

ZTS-100 Z-Thermostat Operations

The following section will guide you through the set up processes for your ZTS-100.

Different listening nodes are able to act as repeaters to enlarge the network range. Please note that all Z-Wave thermostat controllers are designed and manufactured by various vendors whom are compatible with your ZTS-100 as long as they carry the Z-Wave logo:

(Please carefully read through the following then store the manual for future reference.)

Product Overview

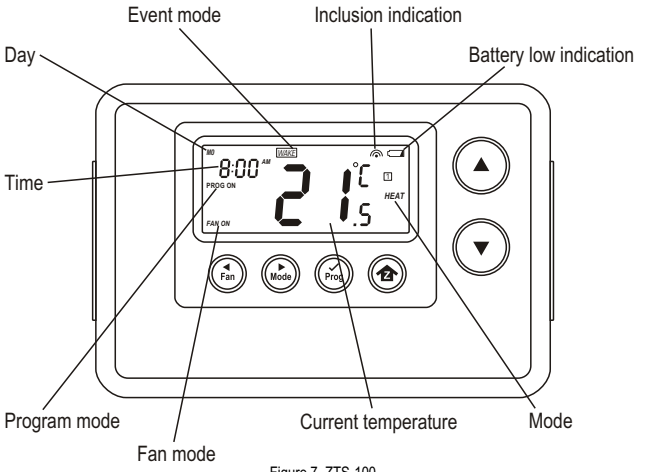


Figure 7. ZTS-100

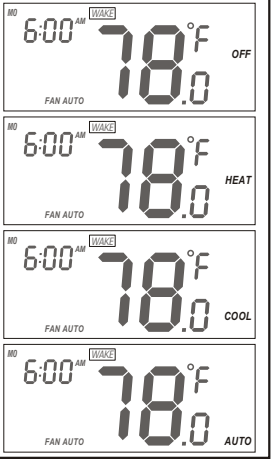
Description of Function Keys

Symbol	Key Description
▲	Increase value / Toggle selection
▼	Decrease value / Toggle selection
Fan	Select fan mode; also the Backward function key in some menus
Mode	Change operation mode; also the Forward function key in some menus
Prog	Select program mode: PROG ON, OVERRIDE and PERMANENT OVERRIDE; also the Confirm function key in some menus
	Back to Home

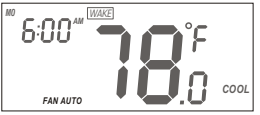
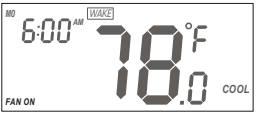
Normal Operation Mode

Change Operation Mode

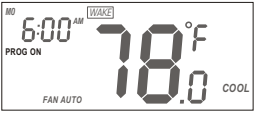
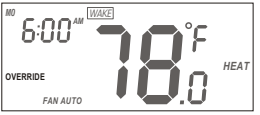
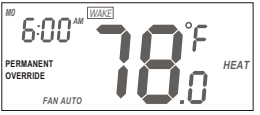
Note 1: In Heat mode *=> it displays "HEAT" if ELECTH is selected.*
=> it displays "HEAT PUMP" if HPUMP is selected.

Step	Procedure / Description	LCD indication
1	Press "Mode" key once to change the operation mode: OFF -> HEAT (PUMP) -> COOL -> AUTO -> OFF	

Select Fan Mode

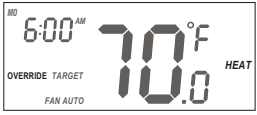
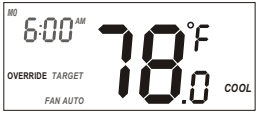
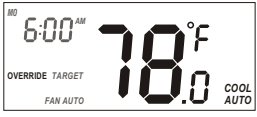
Step	Procedure / Description	LCD indication
1	Press "Fan" key once to change the Fan mode: FAN AUTO -> FAN ON FAN AUTO: Electric heat (HE): Fan runs only when Heating/Cooling is running. Gas heat (HG): Fan runs only when Cooling is running.	
2	Press "Fan" key once to change the Fan mode: FAN ON: Fan stays on all the time.	

Select Program Mode:

Step	Procedure / Description	LCD indication
1	Press "Prog" key once to select PROG mode: PROG ON -> OVERRIDE -> PERMANENT OVERRIDE **PROG ON:** Run the schedule.	
2	Press "Prog" key once to select PROG mode: **OVERRIDE:** Temporary override the current schedule and will go back to "PROG ON" when next time schedule reach.	
3	Press "Prog" key once to select PROG mode: **PERMANENT OVERRIDE:** Permanent override the schedule until user change back to "PROG ON".	

Override/Permanent Override

Note 1: Override/Permanent Override is only available in HEAT, COOL or AUTO mode.

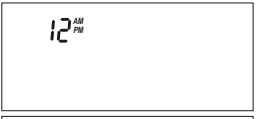
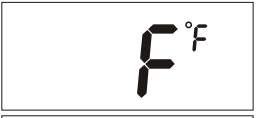
Step	Procedure / Description	LCD indication
1	Press "Prog" key once to select PROG mode: **OVERRIDE** or **PERMANENT OVERRIDE** at Home page.	
2	Press Up/Down key to adjust set point temperature in HEAT or COOL mode. Press "Prog" key once to confirm the setting.	 **or** 
3	In AUTO mode, user needs to set heat and cool set points temperature. Press Up/Down key to adjust auto heat set point temperature in AUTO HEAT mode. Press "Prog" key once to confirm the setting.	
4	Press Up/Down key to adjust auto cool set point temperature in AUTO COOL mode. Press "Prog" key once to confirm the setting and go back to Home page.	

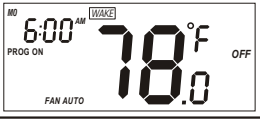
Setting Mode (Set Day, Clock, 12/24 hour, F/C, Swing and Differential)

Symbol	Setting Mode Key Description
▲	Increase value / Toggle selection
▼	Decrease value / Toggle selection
Fan	Backward to previous setting
Mode	Forward to next setting
Prog	Confirm and go to next setting
	Confirm and go back to Home

Setting Mode

Step	Procedure / Description	LCD indication
1	Press and hold "Mode" key for 2 seconds to entry the setting mode. It will display "EASY YES" if it stays in SIMPLE mode. Otherwise, it will display "EASY no" if it stays in NORMAL mode. Press Up/Down key to toggle the selection. Press "Prog" key to confirm your settings. - it will go back to Home page if selected "YES". - it will go to Day setting if selected "no". **SIMPLE mode** **Active items:** - Change Operation mode - Select Fan mode - Temperature Scale selection **Inactive items:** - Scheduling - Program Mode - Clock Display - Setting Time - Setting Swing - Setting Differential Set-Point - Advanced Recovery Mode	

Step	Procedure / Description	LCD indication
2	Day will keep flashing, press Up/Down key to set day from MO-SU.	
3	Press "Prog" key once to confirm the setting and it will go to hour setting. Hour will keep flashing, press Up/Down key to set hour.	
4	Press "Prog" key once to confirm the setting and it will go to minutes setting. Minutes will keep flashing, press Up/Down key to set minutes.	
5	Press "Prog" key once to confirm the setting and it will go to 12/24 hour clock selection. Press Up/Down key to toggle the 12/24 hour clock selection.	
6	Press "Prog" key once to confirm the setting and it will go to temperature F (Fahrenheit) -> C (Celsius) selection. Press Up/Down key to toggle the temperature F (Fahrenheit) -> C (Celsius) selection.	
7	Press "Prog" key once to confirm the setting and it will go to swing setting. Press Up/Down key to set the swing setting. (Range is from 0.5°C to 2°C or 1°F to 4°F)	

Step	Procedure / Description	LCD indication
8	Press "Prog" key once to confirm the setting and it will go to differential set point setting. Press Up/Down key to set the differential set point setting. (Range is from 0.5°C to 2°C or 1°F to 4°F)	
9	Press "Prog" key once to confirm the setting and it will go to Advanced Recovery setting. Press Up/Down key to enable/disable Advanced Recovery Mode.	
10	Press "Prog" key once to confirm the setting and it will go to the Home page.	

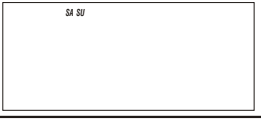
Temperature Scale selection (for SIMPLE mode)

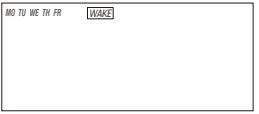
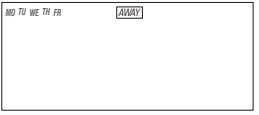
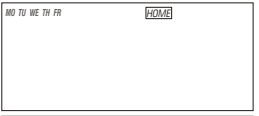
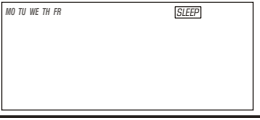
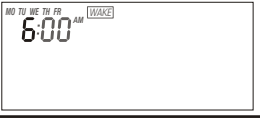
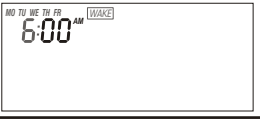
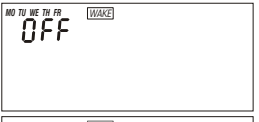
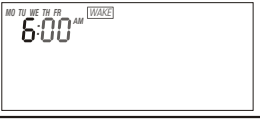
Step	Procedure / Description	LCD indication
1	Press and hold "Prog" keys for 2 seconds to entry temperature F (Fahrenheit) -> C (Celsius) selection. Press Up/Down key to toggle the temperature F (Fahrenheit) -> C (Celsius) selection. Press "Prog" key to confirm it and back to the Home page.	

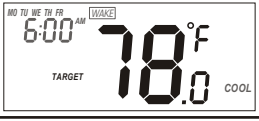
Setting Schedule

Default Schedule:

	Event	Time	Heat	Cool
MO I FR	WAKE	6:00AM	70°F (21°C)	78°F (26°C)
	AWAY	8:00AM	62°F (17°C)	85°F (29°C)
	HOME	6:00PM	70°F (21°C)	78°F (26°C)
	SLEEP	10:00PM	62°F (17°C)	82°F (28°C)
SA I SU	WAKE	6:00AM	70°F (21°C)	78°F (26°C)
	AWAY	10:00AM	62°F (17°C)	85°F (29°C)
	HOME	6:00PM	70°F (21°C)	78°F (26°C)
	SLEEP	11:00PM	62°F (17°C)	82°F (28°C)

Step	Procedure / Description	LCD indication
1	Press and hold "Prog" key for 2 seconds to entry the setting schedule mode. Press Up/Down key to select MO-FR or SA-SU schedule.	 

Step	Procedure / Description	LCD indication
2	Press "Prog" key once to confirm the setting and it will go to event mode. Press Up/Down key to select the event (WAKE -> AWAY -> HOME -> SLEEP).	   
3	Press "Prog" key once to confirm the setting and it will go to hour setting. Hour will keep flashing, press Up/Down key to set hour.	
4	Press "Prog" key once to confirm the setting and it will go to minutes setting. Minutes will keep flashing, press Up/Down key to set minutes.	
5	Press and hold "UP" and "DOWN" key for 2 seconds to disable / enable event during the time setting. If the event is disabled, "OFF" will be displayed. If the event is enabled, time will be displayed and Hour will keep flashing.	 

Step	Procedure / Description	LCD indication
6	Press "Prog" key once to confirm the setting and it will go to target setting. If the event is enabled, it will go to target setting. Target will keep flashing, press Up/Down key to adjust Heat set point for heating. If the event is disabled, it will go to next event setting.	
7	Press "Prog" key once to confirm the setting and it will go to target setting. Target will keep flashing, press Up/Down key to adjust Cool set point for cooling.	
8	Press "Prog" key once to confirm the setting and it will go to next event mode. Follow the program UI to complete the whole scheduling or press Home key once to save and exit.	

Z-Wave Add (Inclusion) / Delete (Exclusion) Mode

Symbol	Inclusion and Exclusion Mode Key Description
▲	N/A
▼	N/A
Fan	N/A
Mode	N/A
Prog	Add (Inclusion) / Delete (Exclusion)
	Back to Home

Note 1: This icon is represent the ZTS-100 has been added into the Z-Wave network. Please perform the Delete (Exclusion) before adding into the new Z-Wave network.

Note 2: User can control the ZTS-100 through gateway or controller after adding into the Z-Wave network.

ZTS-100 can be configured as either "**Frequently Listening Routing Slaves"** (FLiRS) or "**Always Listening"** node and it will distinguish the power source (batteries or 24Vac) automatically and switch to appropriate mode during inclusion stage.

FLiRS node type is targeted for battery operated applications and will enter sleep mode frequently in order to conserve battery consumption that can provide flexibility if there is out of 24Vac power line.

Always Listening node type is targeted for AC power operated applications and it can act as a repeater, which will re-transmit the RF signal to ensure that the signal is received by its intended destination by routing the signal around obstacle and radio dead spots.

Application for out of 24Vac power line:

1. Install AAx4pcs batteries and power up the unit.
2. Execute the step of "Delete (Exclusion) ZTS-100 from Gateway / Controller Z-Wave network".
3. Execute the step of "Add (Inclusion) ZTS-100 to Gateway / Controller Z-Wave network".
4. ZTS-100 will be configured as FLiRS operation after step 3 (inclusion).

ZTS-100 will not response Z-Wave command very quickly as it will enter sleep mode frequently in order to conserve battery consumption.

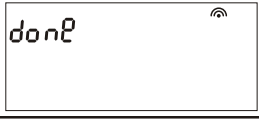
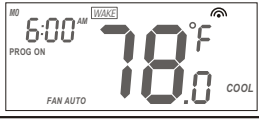
Application for 24Vac power line:

1. Connect 24Vac power and power up the unit, make sure AAx4pcs batteries has been removed.
2. Execute the step of "Delete (Exclusion) ZTS-100 from Gateway / Controller Z-Wave network".
3. Execute the step of "Add (Inclusion) ZTS-100 to Gateway / Controller Z-Wave network".
4. ZTS-100 will be configured as Always Listening operation after step 3 (inclusion).

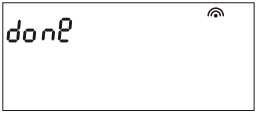
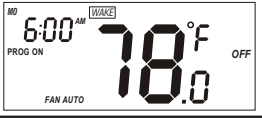
It can install AAx4pcs batteries for power backup purpose after step 4.

Important: *It is not allow changing ZTS-100 operation mode by change of power source. It is need to follow the above steps to change ZTS-100 operation mode.*

Add (Inclusion) ZTS-100 to Gateway / Controller Z-Wave network

Step	Procedure / Description	LCD indication
1	Gateway / Controller device should entry the inclusion mode. Press and hold "Home" key for 2 seconds to entry the Add (Inclusion) / Delete (Exclusion) Mode.	
2	Press "Prog" key once, it will search the network.	
3	If the ZTS-100 is added into the network, the signal of "done" will be shown. Inclusion is completed.	
4	Press "Home" key once to go back to the home page.	

Delete (Exclusion) ZTS-100 from Gateway / Controller Z-Wave network

Step	Procedure / Description	LCD indication
1	Gateway / Controller device should entry the Exclusion mode. Press and hold "Home" key for 2 seconds to entry the Add (Inclusion) / Delete (Exclusion) Mode.	
2	Press "Prog" key once, it will search the network.	
3	If the ZTS-100 is removed from the network, it shows no connection. Exclusion is completed.	
4	Press "Home" key once to go back to the home page.	

Support Association Command Class

ZTS-100 support 2 association groups, each association group contains 5 nodes max. and up to 5 nodes can be assigned in these 2 association groups.

Association group_1:

- ZTS-100 will send out basic set command 0xFF automatically once Heat Pump operation has been started in heating mode.
- ZTS-100 will send out basic set command 0x00 automatically once Heat Pump operation has been stopped in heating mode.

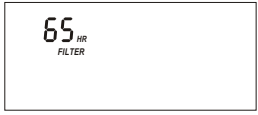
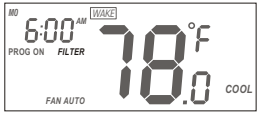
Association group_2:

- ZTS-100 will send out basic set command 0xFF automatically once Compressor operation has been started in cooling mode.
- ZTS-100 will send out basic set command 0x00 automatically once compressor operation has been stopped in cooling mode.

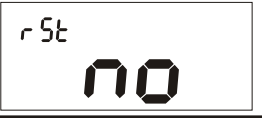
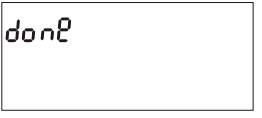
Z-Wave Configuration Command

Parameter Number	Definitions	Parameter value range
1 (0x01)	Swing	0x01 = 0.5 ℃ / 1 ℉ 0x02 = 1.0 ℃ / 2 ℉ **(default)** 0x03 = 1.5 ℃ / 3 ℉ 0x04 = 2.0 ℃ / 4 ℉
2 (0x02)	Differential	0x01 = 0.5 ℃ / 1 ℉ 0x02 = 1.0 ℃ / 2 ℉ **(default)** 0x03 = 1.5 ℃ / 3 ℉ 0x04 = 2.0 ℃ / 4 ℉
3 (0x03)	Set filter counter	0x01F4 to 0x0FA0 **(default = 0x01F4, resolution = 0x0064)** (500 to 4000 hours; resolution=100hrs)
4 (0x04)	Report filter counter **(read only)**	0x0000 to 0x270F (0 to 9999 hours)
5 (0x05)	Scale of temperature	0x00 = ℃ 0x01 = ℉ **(default)**
6 (0x06)	Upper limit of set point (A)	**(A) available range:** Celsius (℃): A = (B+2)min. ~ (37.0℃) max. Fahrenheit (℉): A = (B+4)min. ~ (99.0℉) max. **(default = 99.0℉)**
7 (0x07)	Lower limit of set point (B)	**(B) available range:** Celsius (℃): 5.0℃ to 35.0℃ Fahrenheit (℉): 41.0℉ to 95.0℉ **(default = 41.0℉)**
8 (0x08)	Simple mode	0x00 = Disable (Normal mode) 0x01 = Enable (Simple mode), **default**
9 (0x09)	Time format	0x00 = 24 hours 0x01 = 12 hours (am / pm), **default**
10 (0x0A)	Repeat basic set counter	Value(X): 0x00, 0x03 to 0xFF 0X00 = Disable, **default** Range from 0x03 to 0xFF = 3 minutes to 255 minutes (Thermostat sends "Basic Set" command to its association node repeatedly in every X minutes)

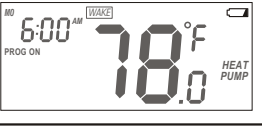
Filter Counter

Step	Procedure / Description	LCD indication
1	Press and hold "Fan" key for 2 seconds to check the filter counter. The "usage hours" will be shown on screen.	
2	Press and hold "Prog" key for 2 seconds to reset the filter counter after replace a new filter.	
3	Press and hold "Mode" key to set the alert time for the filter usage. "Target" icon will be shown on screen and flashing. Press "UP" or "Down" to set the alert time. (Range from 500 to 4000 Hours Step size is 100hrs) Press "Prog" key to confirm the setting and go back to filter counter page. Press "Home" key once to go back to the Home page.	
4	FILTER icon will be shown on the screen at Home page when the usage hours were reached to set time.	

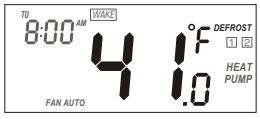
Reset ZTS-100 to Factory Default Settings

Step	Procedure / Description	LCD indication
1	Press and hold "Fan" + "Mode" keys for 2 seconds to entry the reset mode. Press Up/Down key to toggle Yes/No selection.	 
2	Press "Prog" key once to confirm the action. => It will perform the reset if select "Yes" or => It will back to home page if select "No". LCD display done after reset to factory default settings. The following data will be reset to default: 1. Clock : 12:00am 2. Day: Mon 3. Temperature scale: F 4. Swing : 2F 5. Diff: 2F 6. Default schedule 7. Operation mode: OFF 8. Default Heat override set point 9. Default Cool override set point 10. Filter counter cleared 11. Delete from network	

Battery Low Indication

Step	Procedure / Description	LCD indication
1	ZTS-100 thermostat will detect the battery level every 30 minutes; Battery low icon will be displayed at Home page if the battery is running out. (User is required to change new batteries.)	

Defrost Indication

Step	Procedure / Description	LCD indication
1	DEFROST icon will be displayed at Home page if temperature below 41°F/5°C. All heaters will be forced On, except in cool mode.	

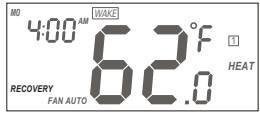
Out of Temperature Range Indication

Step	Procedure / Description	LCD indication
1	HI icon will be displayed on LCD if temperature excess the measurement ranges 99°F/40°C. All heaters will be forced Off. Cooler will turn on if running cool mode.	
2	LO icon will be displayed on LCD if temperature below the measurement ranges 32°F/0°C. All heaters will be forced On, except in cool mode.	

Energy Saving Mode

Step	Procedure / Description	LCD indication
1	User can enable/disable energy saving mode by using Z-Wave BASIC set command only. => Enable energy saving mode Basic set value = 0x00 (off mode) (energy saving mode will be mapped to off mode) => Disable energy saving mode Basic set value = 0xFF (resume mode) (comfort mode will mapped to resume mode)	

Advanced Recovery Indication

Step	Procedure / Description	LCD indication
1	The Advanced Recovery feature allows heating and cooling systems to gradually recover from an energy-saving set point temperature to a comfort set point temperature. Advanced Recovery calculates the time needed to adjust the temperature to the next program setting. When the thermostat is in Advanced Recovery mode, the display will show "RECOVERY". Advanced Recovery is an option that allows the HVAC system to attempt to recover from a setback period and reach a desired comfort temperature set point by the beginning of your programmed comfort period. This option allows the choice whether to use Advanced Recovery under Setting Mode. (Recovery works in heat, cool and auto mode. Maximum Advanced Recovery time is one hour.)	

Short Cycle Start Up Protection

To protect the compressor / Heat pump, those outputs forced off until 3minutes count down finished. Those outputs can be activated according to the room temperature after 3 minutes.

System	Output
Non Heat pump system	Compressor
Heat pump system	1st stage heat and compressor

Frequently Asked Questions

Q Why won't my ZTS-100 work with the Z-Wave devices I purchased from another country?

A Due to different countries regulations Z-Wave products from different regions are set to different frequencies. Before purchasing new devices make sure you have checked to see that the device is compatible in your region.

Q Do I need an electrician to install ZTS-100 in my house?

A It is recommended to install this product by a qualified technician.

Q How do I know which product is compatible to my ZTS-100?

A ZTS-100 should work with any Z-Wave controller or gateway that has control capability for "Thermostat" devices. You can check either the specifications in the manual of your ZTS-100 or also check online at www.remotec.com.hk for a full list of products that can be used with your ZTS-100. All Z-Wave products also come with the Z-Wave logo.

Q Can I use 2 or more ZTS-100 in my house? What is the max. units if yes?

A Yes and it is very depends on the capability of gateway / controller. For example, gateway can supports up to 8, 16 or 32 ZTS-100 in a network.

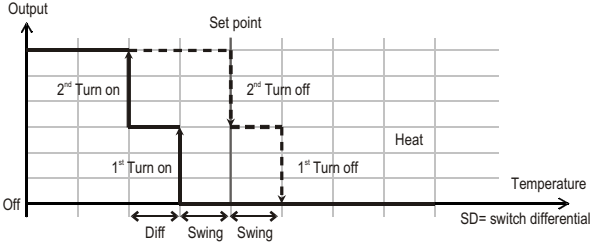
Q Where can I keep up to date with the latest Z-Wave products for my house?

A You can keep up to date by visiting the www.remotec.com.hk website where we will have information and ideas for using Z-Wave technology.

Q What are the operation for Swing and Differential set point?

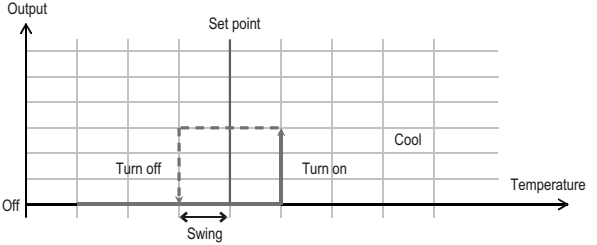
A Below are the detail explanations.

HEAT mode: thermostat controls the temperature according to the following diagram



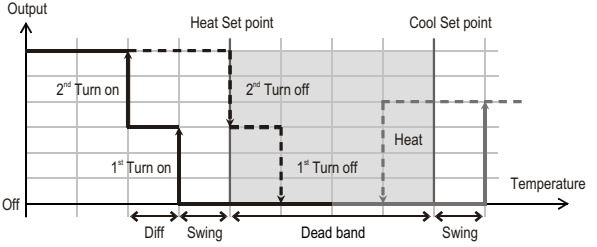
Example for Heating: (Set point = 70°F, Swing = 1°F, Differential = 2°F)
=> 1st stage heater turns on when room temp is 69°F and off at 71°F.
=> 2nd stage heater turns on when room temp is 67°F and off at 70°F.

COOL Mode: thermostat controls the temperature according to the following diagram



Example for Cooling: (Set point = 80°F, Swing = 1°F)
=> Cooler turns on when room temp is 81°F and off at 79°F.

AUTO: thermostat controls the temperature according to the following diagram



There is a dead band 4°F/2°C between heat set point and cool set point.

Example 1: If user select heat set point is 70F, the minimum cool set point will be limited at "heat set point" + 4°F: 74°F

Pervious heat set point is 70°F and cool set point is 74°F
Example 2: If user changes heat set point to 72°F, cool set point will be updated to 76°F automatically to maintain the dead band.

Technical Specifications

Model no.	BW8030US (ZTS-100US) BW8030AU (ZTS-100AU) BW8030EU (ZTS-100EU)
RF frequency	908.4MHz (US) (ZTS-100US) 921.4MHz (AU) (ZTS-100AU) 868.4MHz (EU) (ZTS-100EU)
RF operating distance	Up to 100ft outdoor line of sight, in unobstructed environment
Z-Wave association group	Support 2 association groups; - Each association group contains 5 nodes max. - Up to 5 nodes can be assigned in 2 association groups.
LCD	TN type with white backlight VA=66.5mmx28.5mm
Powered by	Dry battery AA x 4pcs or 24 VAC +/- 20% 50/60Hz
Relay contact	Voltage: 24 VAC 50/60 Hz Current: 1A Max. (inductive)
Temperature measurable range	32 -99°F / 0- 40°C
Temperature display resolution	0.5°F / 0.1°C
Temperature Setting range	41-99°F / 5-37°C
Temperature	Operating: 32-122°F / 0-50°C Storage: 23-140°F / -5-60°C
Dimension (L x H x T)	145mm x 100mm x 25mm
Weight	170g (Batteries excluded)

Z-Wave device type		
Basic Device Class: Routing_Slave (Enhanced_Lib)		
Generic Device Class: Thermostat		
Specific Device Class: Thermostat general v2		
Z-Wave Command Class	**Controlled**	**Supported**
COMMAND_CLASS_THERMOSTAT_FAN_MODE	NO	YES
COMMAND_CLASS_THERMOSTAT_FAN_STATE	NO	YES
COMMAND_CLASS_THERMOSTAT_MODE	NO	YES
COMMAND_CLASS_THERMOSTAT_SETPOINT	NO	YES
COMMAND_CLASS_THERMOSTAT_OPERATING_STATE	NO	YES
COMMAND_CLASS_THERMOSTAT_SETBACK	NO	YES
COMMAND_CLASS_SENSOR_MULTILEVEL	NO	YES
COMMAND_CLASS_CLOCK	NO	YES
COMMAND_CLASS_BATTERY	NO	YES
COMMAND_CLASS_BASIC	YES	YES
COMMAND_CLASS_VERSION	NO	YES
COMMAND_CLASS_MANUFACTURER_SPECIFIC	NO	YES
COMMAND_CLASS_ASSOCIATION	NO	YES
COMMAND_CLASS_CONFIGURATION	NO	YES

Checking Accessories

After opening the cover of the packing box, check that the following accessories are included.

- ZTS-100: Z-Thermostat
- Screw + Wall Anchor x 4pcs
- User Manual (download from our website)

FCC Notice

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warnings

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

- **RISK OF FIRE**
- **RISK OF ELECTRICAL SHOCK**
- **RISK OF BURNS**

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available.

Caution

- Risk of explosion if battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.

www.remotec.com.hk